water through the stems of submerged aquatics. To call such a stream "the transpiration current" is manifestly absurd, unless one changes the meaning of the word transpiration. It will be remembered that others have found evidence of like movements, so that these new experiments only add somewhat clearer evidence as to its existence, which the most elementary consideration of the physical conditions would lead one to expect. Yet these authors naïvely say: "Probably external conditions also affect the results; this point we hope to investigate later." This really is the fundamental point: does not the heating of the leaves create the conditions for the circulation of water as truly in this case as in a house heating system?—C. R. B.

Fixation of free nitrogen.—POLLACCI reports in a preliminary note[39] that in a large number of experiments he has demonstrated the fixation of free nitrogen in such plants as lichen, salvinia, azolla, fern prothallia, and duckweed. The increase of total N in a few cases cited amounts to 33–67 per cent. The full paper will be awaited with interest. POLLACCI has a heavy weight of adverse evidence to counterbalance. He indicates that the contradictory results of the earlier observers, e. g., BOUSSINGAULT and VILLE, were probably due to differences in the capacity of different plants for this fixation. It is to be remembered, however, that all the recent evidence under improved chemical methods is adverse to the idea that ordinary plants are able to utilize N_2.—C. R. B.

Prothallium and embryo of Danaea.—CAMPBELL[40] has made a preliminary investigation of the prothallium and embryo in several species of Danaea secured in Jamaica. The archegonia are remarkable for the imperfect development of the ventral canal cell, which in many cases could not be demonstrated at all. The fertilized egg becomes elongated in the direction of the axis of the archegonium before the first division. The hypobasal cell does not divide or there is a single division, resulting in a short suspensor, all of the regions of the embryo arising from the epibasal cell. This cell gives rise to somewhat irregular quadrants, the two lower ones forming the foot, and the two upper giving rise to stem tip and leaf, and later to the root.—J. M. C.

Chromosomes of Hyacinthus.—Miss HYDE[41] finds that in Hyacinthus in the prophase of the heterotypic mitosis the spirem twists into 8 loops which become 8 chromosomes. The loops break apart at the center so as to form 8 bivalent chromosomes. When fully formed, the chromosomes show a striking difference in size, 4 being comparatively large, 3 small, and the remaining one intermediate.

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[39] POLLACCI, G., Ricerche sull' assimilazione dell' azoto atmosferico nei vegetali. Atti Ist. Bot. Univ. Pavia II. **13**:351–354. 1909.

[40] CAMPBELL, D. H., The prothallium and embryo of Danaea. Preliminary note. Annals of Botany **23**:691. 1909.

[41] HYDE, EDITH, The reduction division in the anthers of *Hyacinthus orientalis* Ohio Naturalist **9**:539–544. *pl. 32.* 1909.

Miss HYDE believes that the two chromosomes which must have united to form a bivalent chromosome are alike in size and shape, and that they represent paternal and maternal bodies. If extended observation should show that the differentiation of chromosomes shown in the figures is constant, this form would repay a thorough investigation.—CHARLES J. CHAMBERLAIN.

Apogamy in Oenothera.—In connection with his cultures of Oenothera, GATES[42] has discovered apogamy in *O. lata*, one of the mutants of *O. Lamarckiana*. The anthers of *O. lata* from the Amsterdam cultures are persistently sterile, and this fact, associated in certain other genera with apogamy, suggested the possibility of apogamy in this form. To determine this, the anthers and styles of several flowers (on one individual) were removed and the flowers bagged as usual in making guarded crosses. All of these flowers gave negative results except one, which produced three fairly good seeds. The cytological investigation necessary to substantiate and explain this result is being made.—J. M. C.

Heath vegetation.—Some of the ecological similarities of the coastal and barren regions of New York and New Jersey and the heath of Luneneburg are pointed out by LIVINGSTON,[43] who would account for the desert-like aspect of the vegetation of the heath of Luneneburg by the too rapid drainage of the soil and the short growing season. The areas of bog or marsh found scattered through the heath are also physiologically dry, perhaps mainly because of the toxic organic matter present in the soil; hence such areas differ little in aspect from the heath. Both the heath and the moor are dominated by *Calluna vulgaris*, while *Juniperus communis* is conspicuous on the open heath.—GEO. D. FULLER.

The "knee joint" of Mougeotia.—Observations upon several species of Mougeotia indicate to NIEUWLAND[44] that the prevalent interpretation of "knee joints" as a stage in conjugation is incorrect, for the joints are present only in vegetative stages and never in typically conjugating material. Usually the cells of the filament hold together so firmly that the cells break through the middle rather than separate at the ends, but in material with the knee joints, the cells are easily dissociated, and, succeeding the appearance of the joints, the amount of material increases enormously, so that the joints seem to be related to vegetative multiplication.—CHARLES J. CHAMBERLAIN.

Absorption of water by leaves.—In a lecture before the Royal Horticultural Society of London,[45] HENSLOW presented reasons derived from the older experiments and some recent ones by himself (which, by the way, are not all well con-

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[42] GATES, R. R., Apogamy in Oenothera. Science N. S. **30**: 691–694. 1909.

[43] LIVINGSTON, B. E., The heath of Luneneburg. Plant World **12**: 231–240. 1909.

[44] NIEUWLAND, J. A., The "knee joint" of species of Mougeotia. Midland Naturalist **1**: 82–84. 1909.

[45] HENSLOW, G., On the absorption of rain and dew by the green parts of plants. Jour. Roy. Hort. Soc. London **34**: 167–178. 1908.